them is an essential component of CER. The Atrial Fibrillation methods guidance was developed in a unique process to improve the future quality of evidence with a balance between internal validity and external generalizability.

PCV92

DRUG APPROVAL STRATEGIES IN GERMANY

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OBJECTIVES: The German legislator introduced early benefit assessments of almost all new drug approvals in 2011. Within one year after approval, the pharmaceutical manufacturer and the Statutory Health Insurance funds negotiate a rebate based on the early benefit assessment. For each new drug, a common rebate for all indications is negotiated. Therefore, the manufacturer needs to analyze whether or not to seek approval for each potential indication. We aim to analyze the manufacturer's decision. **METHODS:** We develop a binary decision model to determine profitability of each indication. Profitability is defined as a positive contribution to the manufacturer's global revenue. We apply our model to Ticagrelor as an example. Ticagrelor was the first drug that was subject to an early benefit assessment. The assessment is publicly available and delivers information for four indications. **RESULTS:** The approval decision for a specific indication depends on five factors: 1) Expected benefit as determined by the early benefit assessment; 2) Expected DDDs in Germany; 3) Willingness for off-label use in the indication in Germany; 4) Expected DDDs globally; and 5) Impact of the German price on the mean global price. **CONCLUSIONS:** The approval decision proves to be complex. Ticagrelor's early benefit assessment has shown the important role of the comparator used in the assessment. The manufacturer named no trials to prove benefit over the adequate comparators for STEMI (percutaneous coronary intervention) and STEMI (coronary artery bypass grafting). Willingness for off-label use, however, is high, as currently observed for Clopidogrel. For such a case, our model shows that it is profitable to just seek approval for the indication with the greatest additional benefit (unstable angina/NSTEMI). Based on the best indication, the manufacturer can negotiate a smaller rebate. Additional revenue is generated if off-label prescriptions are common in other indications.

PCV93

MARKET RESPONSE TO FOOD AND DRUG ADMINISTRATION'S SAFETY WARNINGS: A CASE STUDY USING AN INTERRUPTED TIME SERIES ANALYSIS OF THE MEDICARE DATABASE FOR 2006-2008

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OBJECTIVES: To evaluate the impact of Food and Drug Administration (FDA) safety warning on the utilization rates of thiazolidinedione oral anti-diabetes medications using an interrupted time series analysis. **METHODS:** The analysis used data from the five percent national sample of Medicare Part D beneficiaries. Beneficiaries were included if they were diabetic, continuously enrolled in Part D and had filled a prescription for a thiazolidinedione medication at any time during the period of January 2006 through December 2008. Beneficiaries were classified each month into appropriate-use, at risk, and contraindicated groups based on the presence of certain comorbid conditions. Data were aggregated to monthly utilization rates. Analyses examined the effects of the May 2007 FDA safety warnings about the ongoing review of rosiglitazone's potential to increase cardiovascular risks on thiazolidinedione utilization rates for the different appropriateness of use categories using an interrupted time series consisting of 32 data points (13 months before and 19 months after the safety warning). **RESULTS:** There was an increasing trend in the total utilization rates of thiazolidinediones before the safety warning. Significant decline in drug utilization rates were observed at the end of the study period for all patient groups on rosiglitazone (relative difference -74.78%, -79.93%, and -90.21% in appropriate-use, at risk and contraindicated patient groups, respectively). The intervention did not have significant immediate effects on the post-intervention utilization rates of pioglitazone. However, after the intervention, a general decline in utilization of thiazolidinediones, including pioglitazone, was observed. **CONCLUSIONS:** The initial safety warning about rosiglitazone's cardiovascular safety was effective in decreasing rosiglitazone's utilization in the targeted population and thus appeared to achieve the desired safety effects. The safety warning, however, also had spillover effects by reducing utilization of drugs in other patient cohorts not targeted by the warning.

PCV94

UNPACKING THE RAPID GRWOTH OF PHARMACEUTICAL SPENDING GROWTH: A CASE ANALYSIS OF CHINESE HOSPITAL

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OBJECTIVES: Pharmaceutical expenditure is rapidly growing and accounts for 40-50 percent of total medical care expenditures. In order to contain drug expenditure growth effectively, we need to understand what the drivers are. This study aims to answer the question by decomposing the pharmaceutical expenditure changes into prices, volume, and product substitution effects. **METHODS:** By using quarterly drug sales records from 2006-2011 of a large public hospital in Sichuan province, we analyze the pharmaceutical expenditure changes for two therapeutic groups: antibiotics (249 products molecules with 2491 records) and cardiovascular(130 products molecules with1668 records). After standardizing volume and price recommended by DDD (WHO), a statistic index factor analysis is employed. Specifically, Laspeyres price index (LPI) and chained LPI are employed to calculate the price changes with and without entry and exit of products over time. We also take a closer look at the substitution pattern, including shift among therapeutic groups, shift between brand and generic drugs, and shift between old and new drugs. **RESULTS:** Our results show that both antibiotics and cardiovascular drug expenditures increased over 30% in the past 5 years. Interestingly, prices are continuously dropping and the volumes are slightly increasing for both antibiotics and cardiovascular drugs. Relatively speaking, substitution effect plays the most important role in expenditure growth. Specifically, proportions of brand-name drugs, new drugs, and more therapeutic advanced drugs are increasing over time. **CONCLUSIONS:** Our study indicates that the key factor that contributes to the expenditure growth is product substitution effect. Thus, price control policies may not be an effective way to control the rapid pharmaceutical expenditure growth. Instead, more attention should be paid on how to control the substitution shifts, which may be caused by prescriber behavior and consumer demand. Further analysis should also be on the impact of substitution shift on quality of health care.

PCV95

PREVALENCE AND DETERMINANTS OF PHARMACOTHERAPY IN MYOCARDIAL INFARCTION PATIENTS

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OBJECTIVES: To assess the prevalence and determinants of pharmacotherapy in patients with myocardial infarction. **METHODS:** The Medical Expenditure Panel Survey (MEPS) data from 2004 to 2008 were used to conduct a retrospective cross-sectional study. Study sample included adults ≥ 18 years with myocardial infarction. Pharmacotherapy was defined as the use of aspirin, beta-blockers, statins or ACEI/ARB. Descriptive characteristics were used to describe the study sample and utilization patterns. The predictors of pharmacotherapy use were modeled based on the Andersen Behavior Model using logistic regression. The year variable and the Charlson's comorbidity index score (CCI) was also included in the analyses. A p-value of 0.05 was considered to be statistically significant. **RESULTS:** According to the MEPS, 55% of the patients received ACEI/ARBs, 68% received beta-blockers, 64% received statins and 75% received aspirin. Individuals who had a usual source of healthcare were twice as more likely to receive ACEI/ARBs (OR: 2.15; CI: 1.20 – 3.84). Also, patients who were publicly insured (OR: 0.50; CI: 0.28 – 0.90), those who resided in metropolitan region (OR: 0.69; CI: 0.50 – 0.95) and patients having a CCI score of 2, 3 or 4 were less likely to receive ACEI/ARBs. Females (OR: 0.63; CI: 0.44 – 0.91), blacks (OR: 0.45; CI: 0.30 – 0.66) and individuals who had a CCI score of 10 (OR: 0.22; CI: 0.08 – 0.58) were less likely to receive beta-blockers. Also, as age increased, the likelihood of taking beta-blockers (OR: 1.22; CI: 1.11 – 1.34) and aspirin (OR: 1.24; CI: 1.11 – 1.39) increased. Patients who had a usual source of healthcare were 3 times as likely to receive statins (OR: 3.05; CI: 1.53 – 6.10). **CONCLUSIONS:** Analyses of national level data revealed suboptimal utilization of evidence-based pharmacotherapy for management of myocardial infarction. Concerted efforts are needed to optimize pharmacotherapy in patients with myocardial infarction.

PCV96

TRENDS IN UTILIZATION FOR RATE-CONTROL AND RHYTHM-CONTROL DRUGS FROM 2001 TO 2009: RESULTS FROM THE NATIONAL AMBULATORY MEDICAL CARE SURVEY

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OBJECTIVES: Results from several clinical trials have showed that rhythm-control drugs, which have serious adverse events, have no survival advantage over rate-control drugs in patients with atrial fibrillation (AF). The objective of the study was to determine 1) the trends in utilization for rate-control and rhythm-control drugs from 2001 to 2009; and 2) if the utilization of rhythm-control drugs decreased over time. **METHODS:** The physician's-office and outpatient data components of the National Ambulatory Medical Care Survey (NAMCS) from 2001 to 2009 were used. Visits with AF were identified by ICD-9 diagnosis code, '427.31'. From these visits, visits with mentions of rate-control drugs, beta blockers (e.g. metoprolol, propranolol, carvedilol, etc.) and non-dihydropyridine calcium channel blockers (verapamil and diltiazem) and visits with mentions of rhythm-control drugs (e.g. amiodarone, disopyramide, propafenone, etc.) were identified using drug codes provided by NAMCS. Trends in utilization were calculated as total number of visits with prescriptions divided by total number of visits with AF for each year. **RESULTS:** From 2001 to 2009, visits with AF rose from 6.83 million to 11.56 million. The prescription rate for rate-control drugs increased from 24.28% to 62.31% from 2001 to 2009. The prescription rate for rhythm-control drugs remained the same, 5.31% in 2001 and 5.14% in 2009. The prescription rate for any pharmacotherapy for AF increased from 29.32% to 67.44% from 2001 to 2009. **CONCLUSIONS:** The utilization of rhythm-control drugs remained constant while that of rate- control drugs increased from 2001 to 2009. Previously, the treatment approach for AF was to achieve normal sinus rhythm with rhythm-control drugs and direct current cardioversion, rather than use the rate-control drugs. Following the trials on rate-control and rhythm-control drugs, the use of rate-control strategy increased.

PCV97

REAL WORLD PATIENT PROFILE OF PATIENTS WITH REDUCED EJECTION FRACTION HEART FAILURE (HF-REF) IN 5 REGIONS OF CHINA

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